

### **REMARKS**

Attached hereto is a marked-up version of the changes made to the specification by the current Amendment. The attached is captioned "**Version with markings to show changes made**".

The present Amendment cancels claims 1-34 and adds new claims 35-37. Therefore, the present application has pending claims 35-37.

In paragraph 7 of the Office Action the Examiner objected to informalities in the specification. Various amendments were made throughout the specification to correct the informalities noted by the Examiner. Therefore, Applicants submit that this objection is overcome and should be withdrawn.

In paragraph 5 of the Office Action the Examiner request that proper drawing corrections be provided in response to the Office Action. Filed on even date herewith are Corrected Drawings.

Claim 8 stands rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as the invention. As indicated above, claim 8 was canceled. Therefore, this rejection is rendered moot.

In the Office Action the Examiner rejected claims 1, 2, 6, 8, 9, 11-16, 19-22, 24 and 27-31 under 35 USC §103(a) as being unpatentable over Rabinovich (U.S. Patent No. 6,256,675) in view of Olson (U.S. Patent No. 5,995,980); rejected claims 4, 5 and 7 under 35 USC §103(a) as being unpatentable over Rabinovich in view of Olson and further in view of Sugaya (U.S. Patent No. 5,970,485); rejected claims 17, 18 and 25 under 35 USC §103(a) as being unpatentable over Rabinovich in view of

Olson and further of Sugaya; rejected claim 23 under 35 USC §103(a) as being unpatentable over Rabinovich in view of Olson and further in view of Applicants' alleged admitted prior art namely the Ullman reference entitled "Principles of Database and Knowledge-base Systems"; rejected claims 33 and 34 under 35 USC §103(a) as being unpatentable over Rabinovich in view of Olson and further in view of Hartley (U.S. Patent Application Publication US 2001/0,032,207-A); rejected claims 30 and 31 stand rejected under 35 USC §103(a) as being unpatentable over Rabinovich in view of Olson and further in view Chappell (the article entitled "Understanding ActiveX and OLE"); and rejected claim 10 under 35 USC §103(a) as being unpatentable over Rabinovich, and Olson and further in view of Castelli (U.S. Patent No. 5,978,788), Fein (U.S. Patent No. 5,924,108), Sonohara (U.S. Patent No. 5,898,794), Unenoyama (U.S. Patent No. 5,982,432) and Schwartz (U.S. Patent No. 4,755,889). As indicated above, claims 1-34 were canceled. Therefore, these rejections are rendered moot.

New claims 35-37 are directed to features of the present invention not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, new claims 35-37 are directed to a data warehouse system having a plurality of client servers each for accepting a processing request from each user thereof, a server provided with a database and use for searching the database according access request from the client devices, a data collector associated with the client devices and provided with a storage device for collecting data requested by users of the client devices and storing the data into the storage device as a replica which is partially replicating the database, and a

network for connecting the client devices to the servers respectively via the data collector.

According to the present invention, the data collector includes a replica creation control means for determining whether a new replica of the database is to be created and stored in the storage device or not in response to a replica creation request from one of the client devices by referring to a replica management table which holds at least a data range and a data updating interval of each replica stored in the storage device, a query analysis unit for analyzing a query processing request from one of the client devices to select, as an object to be searched, a replica stored in the storage or the database, a query processing unit for searching the replica stored in the storage device according to analysis result from the query analysis unit, and a communication control unit for selecting a procedure for accessing the server according to the analysis result.

Further according to the present invention, the server includes a communication control unit for receiving a query analysis result transmitted from the data collectors, and a query processing unit for searching database of the server. The above described features of the present invention are illustrated, for example, in Fig. 1 of the present application.

As set forth in the present application and the claims, a replica management table as illustrated in Fig. 8 holds at least a data range 801 and data updating interval 803 of each replica stored in a storage device 112 as illustrated in Fig. 1. A replica creation request is issued from a client device 103 to a data collector. The data collector 101 has a replica creation control means 106, 107 which determines

whether a new replica is to be created and stored in the local storage device by referring to the replica management table. If the data range and the data updating interval of the requested replica meets those of a stored replica, a new replica is not created. The Examiner's attention is directed to the last paragraph on page 25 of the present application. Thus, according to the present invention the storage resource for the replicas is saved.

The above described features of the present invention as now more clearly recited in new claims 35-37 are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly the above described features of the present invention are not taught or suggested by the primary references used by the Examiner to reject the claims, Rabinovich, Olson and Sugaya.

Rabinovich teaches in col. 8, lines 7-49 thereof that the distribution of requests for replicas to the hosts are managed based on the closest host, as indicated by a "distance metric", and a decision metric for each host as illustrated in Fig. 4. In other words in Rabinovich requests for replicas are managed by considering the load of each of the hosts and distance of the host from the requester. Thus, there is no teaching or suggestion in Rabinovich of the above described features of the present invention for controlling the creation of a new partial replica of a remote database as recited in the claims.

Therefore, Rabinovich fails to teach or suggest a data collector associated with said client devices and provided with a storage device, for collecting data requested by users of said client devices and storing the data into said storage

device as a replica which is partially replicating said database as recited in the claims.

Further, Rabinovich fails to teach or suggest that the data collector includes a replica creation control means for determining whether a new replica of said database is to be created and stored in said storage device, in response to a replica creation request from one of said client devices, by referring to a replica management table which holds at least a data range and a data updating interval of each replica stored in the storage device as recited in the claims.

Still further, Rabinovich fails to teach or suggest the data collector also includes a query analysis unit for analyzing a query processing request from one of said client devices to select, as an object to be searched, a replica stored in said storage device or said database, a query processing unit for searching said replica stored in said storage device according to a query analysis result from said query analysis unit, and a communication control unit for selecting a procedure for accessing said server according to said query analysis result as recited in the claims.

Still further yet, Rabinovich fails to teach or suggest a server which includes a communication control unit for receiving said query analysis result transmitted from said data collector, and a query processing unit for searching the database of said server as recited in the claims.

Therefore, as is clear from the above the features of the present invention as recited in the claims are not taught or suggested by Rabinovich.

The above noted deficiencies of Rabinovich are not supplied by any of the other references of record, namely Olson, Sugaya, Applicants' alleged admitted prior

art, Hartley, Chappell, Castelli, Fein, Sunohara, Uenoyama, or Schwartz. Therefore, Rabinovich whether taken individually or in combination with any of the other references of record, as suggested by the Examiner, fails to teach or suggest the features of the present invention as recited in new claims 35-37.

Therefore, Rabinovich, Olson and each of the other references of record fails to teach or suggest a data collector associated with the client devices and provided with a storage device for collecting data requested by users of the client devices and storing the data into the storage device as a replica which is partially replicating the database as recited in the claims.

Accordingly, the examiner is respectfully requested to reconsider and withdraw each of the above noted rejections.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-34.

In view of the foregoing amendments and remarks, Applicants submit that claims 35-37 are in condition for allowance. Accordingly, early allowance of claims 35-37 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to

the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No.  
01-2135 (501.37841X00).

Respectfully submitted,

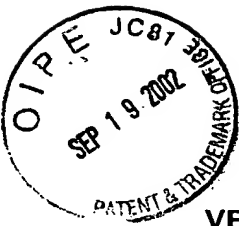
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

Please amend the substitute specification as follows:

Please replace the paragraph beginning at page 5, line 18 through page 6, line 7 with the following rewritten paragraph:

-- In spite of this, if a simple copy method is employed to create replicas from a plurality of servers in a distributed environment, a large scale storage unit 1315 is indispensable for storing those replicas at each client side. For example, if a client tries to integrate 10 servers, each of which has about 300GB (giga bytes: ~~400~~10<sup>9</sup> bytes), the user must also provide a storage unit of 3TB (3 00GB X 10 servers in a simple calculation), and so the present technique will not actually be effective to prepare such a large scale storage unit at the client side. In addition, because a mass of data is transferred from a server to the client via a network when a replica is created, this will increase the load on the network significantly. If the data in the server is updated after a replica is created, the replica that was created by using the server's data must also be updated; and, thereby the cost of the updating will also be increased to an extent which cannot be disregarded, since this updating cost is proportional to the size of the replica. This method will not be a preferred example for data warehouse systems in a distributed environment. --

Please replace the paragraph beginning at page 11, line 5, with the following rewritten paragraph:



-- A replica can be created so as to satisfy part or the whole of each replica creation request as follows. At first, the data collector accepts a replica creation request from a client. The request includes conditions such as the data quality, the precision, freshness, and priority of the data given from a user through the client, as well as the condition of the data collecting range. The data collector then holds the request. After that, the data collector negotiates with a server which supplies the object data considering the values of available resources, such as the storage unit capacity, the CPU performance, etc., thereby creating a replica which satisfies part or the whole of the replica creation request. Because a replica creation request is given from each user, it is possible to collect the data wanted by the user, thereby the hit ratio of each replica ~~tan~~can be improved to achieve the seventh object. Furthermore, because the data quality is adjusted when each replica is created, it is possible to create the object replica in a proper size according to the computer resources available for the data collector, thereby the reduction of the load on the object network, which is the fourth object, can be achieved and the reduction of the capacity of the storage unit of each client and the data collector, which is the fifth object, can be achieved. In addition, the reduction of the updating cost for each replica, which is the sixth object, can be achieved. --

Please replace the paragraph beginning at page 21, line 19 through page 22, line 19 with the following rewritten paragraph:

-- Hereunder, the negotiation processing in step 211 will be described in detail with reference to Figs. 1 and 3. At first, a replica creation request is transferred from the data collector 101 to the server 114 (step 302). Then, if the server accepts the

request (if Yes is selected in the decision step 303), the replica creation request (a rate in a accounting system) is defined as a condition for creating the replica requested by the data collector (step 310), then the replica creation management unit 107 of the data collector updates the replica management table 108 and the delivery data management unit 118 of the server updates the delivery data management table 120 according to the created condition, and the negotiation processing is ended (step 311). If there is no new condition to be presented to the data collector from the server (if No is selected in the decision step 312) when the replica creation request transferred from the data collector cannot be accepted (if No is selected in the decision step 303), the negotiation processing is ended without setting any information related to the replica creation request (step 311). If there is a new condition presented by the server to the data collector (if Yes is selected in the decision step 312) when the server cannot accept a replica creation request transferred from the data collector (when No is selected in the decision step 303), then the server transfers the new condition to the data collector (step 306). If the data collector accepts the condition presented by the server (if Yes is selected in the decision step 307), then the replica management table of the data collector and the delivery data management table of the server are updated ~~according~~<sup>4</sup>ing according to the new condition defined as a replica creation condition (step 310), then the negotiation processing is ended (step 311). If the data collector cannot accept the condition presented by the server (if No is selected in the decision step 307), then the negotiation processing is ended without setting any information related to the replica creation request. --